“Neural circuits for visual processing in thalamus”
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Abstract
The thalamus is often viewed as a gatekeeper, relaying sensory signals to the cortex during waking and halting their flow during sleep. While true, this is an impoverished description. Our work explores how thalamic circuits contribute to sensory processing per se. We focus on the lateral geniculate nucleus, which conveys information from the eye downstream. Relay cells in the geniculate make few connections with each other but are embedded in two dense inhibitory networks. First, local Interneurons supply feedforward inhibition; second, neurons in the visual sector of thalamic reticular nucleus (a thin sheet of gabaergic cells that cloak the thalamus) provide feedback inhibition. The initial part of the presentation explores how retinogeniculate divergence and convergence, coupled with feedforward inhibition, might facilitate signal detection and enhance perceptual acuity. The later part explores the role of the reticular nucleus, from the perspectives of feature detection and spatial attention.

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